Introduction

to

Microsoft Excel 5.0

Student Guide

National Institutes of Health
Clinical Center
Information Technology Center

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Introduction To Microsoft Word 6.0

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LESSON 1: THE BASICS

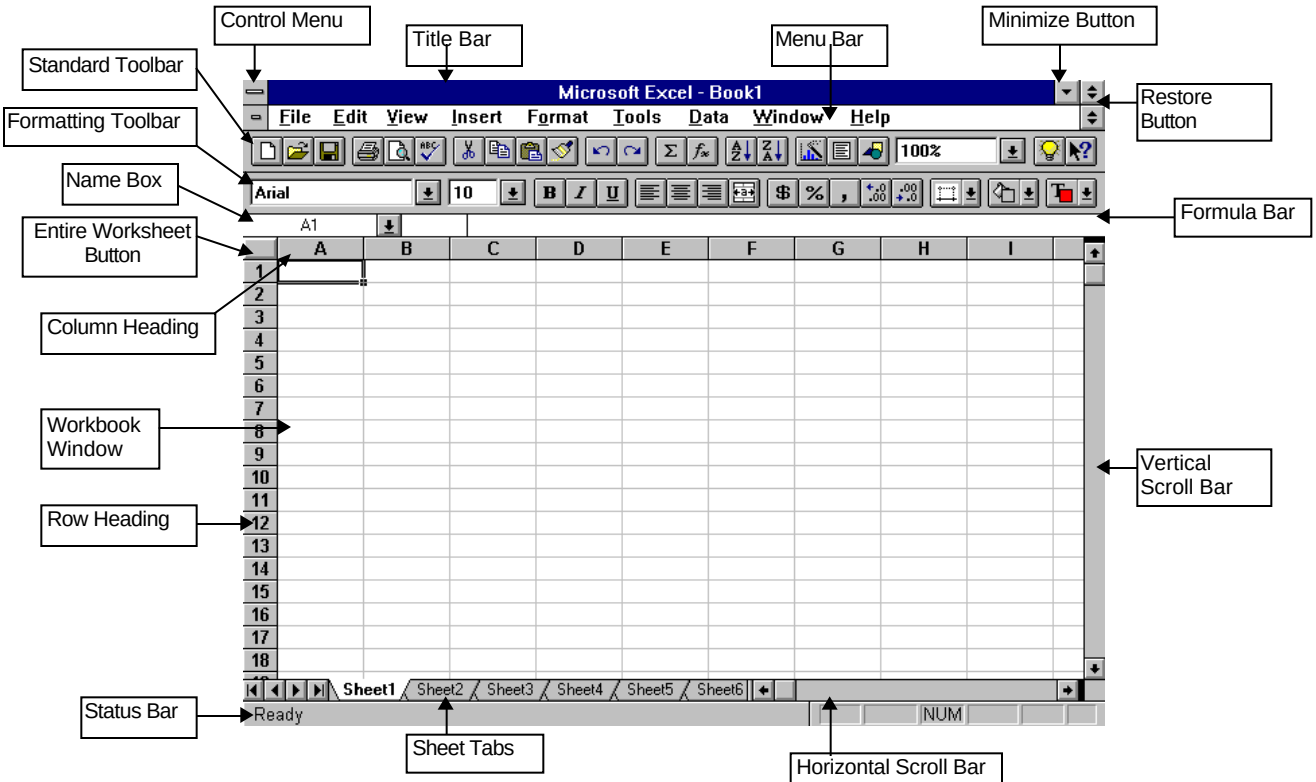
Microsoft Excel is a complete spreadsheet program. It is a user friendly package that works with a WYSIWYG concept. The worksheet program uses the screen as a large standard ledger paper that is divided into rows and columns. This electronic worksheets allow simple manipulation of numerical data for financial planning and forecasting, inventory control, and any other task that requires a series of calculations. In addition to creating worksheets, Excel also has tremendous charting and data format capabilities.

LESSON 1: OBJECTIVES

At the end of this lesson you will be able to…

- Access toolbars
- Move around a worksheet
- Enter worksheet information
- Use the On-line help feature
- Understand the Undo feature
- Save a workbook

The Main Screen Layout



Title Bar - Displays the name of the application. As part of the title bar, three buttons may be viewed.

Menu Bar - Displays the names of the application menus in Excel. From the menu bar, drop down menus are invoked and various options may be selected. Commands may be invoked by clicking on the menu selection, or by using the <ALT> key in combination with the underlined letter (often referred to as hot keys).

Toolbars - Contains buttons for quickly executing the most commonly used Excel commands. You can customize the toolbar so that it includes only buttons for the commands that you use most often. (More about toolbars will be discussed in the next section).

Formula Bar - Displayed either below the last toolbar docked at the top of your worksheet or it is located after the menu bar if you do not have any toolbars shown.

The formula bar is the area where text and formulas are viewed in the worksheet. Edit icons appear when the formula bar is active. When the worksheet is active the formula bar is inactive; when the formula bar is active the worksheet is inactive. The formula bar can be activated by the <**F2**> key or by clicking inside it. Once the edit icons and I bar appear, the formula bar is active and ready to accept information. The Name list box 

. indicates where the active cell resides currently. The **Cancel** button  indicates cancel and the keyboard equivalent is <**Esc**>. Selecting this button will erase the contents of the formula bar. The **Accept** button  indicates accept and the keyboard equivalent is <**Enter**>. Selecting this button will enter the contents of the formula bar into the active cell. The **Function Wizard** button  , helps you build functions. Selecting this button will place you in the Function Wizard dialog box.

Status Bar - is located at the bottom of the screen. It shows what Excel is prepared to do next. It also displays prompts and explanations of the current command and locked key indicators.

Formatting Toolbar - Contains buttons for adding character formatting, such as boldface, italics, and underline, and for setting paragraph alignment and numbering.

Scroll Bars - Vertical & Horizontal. Used to display parts of a document not currently visible in the document window. A document can be repositioned by clicking on one of the scroll bar arrows, clicking in the gray space on either side of the scroll box, or by dragging the scroll box.

Mouse Pointer - Shows where the next action will occur if you click the mouse button. The mouse pointer is shaped like an I-beam when you point to unselected text, and an arrow when you point to selected text, the selection bar, menus or toolbars.

Workbook Window - Displays the ***workbook***. This is the file in which you work and save your data. An empty workbook is automatically loaded when starting Excel called Book. Each workbook can contain many worksheets.

- An Excel workbook file can contain up to 256 separate worksheets (16 is the default). Worksheet 1 is automatically selected when you open a new Workbook. The number of worksheets you can have in one workbook depends upon the size of the individual worksheets as well as how well your resources are maximized.
- The ***worksheet*** is a rectangular grid of rows and columns of data which is used to perform numeric analysis. As you add or change data, the worksheet automatically recalculates the relationships among the data.
- The Excel worksheet is made up of 256 columns and 16,384 rows. Columns are designated by letters running across the top of the worksheet and rows are designated by numbers running down the left border of the worksheet. Column headings begin with A and end with IV. Row headings begin with the number 1 and end with the number 16,384.
- The ***cell*** is the basic unit of a worksheet in which you store data. It is the intersection between rows and columns.
- A cell's location is identified by a set of coordinates called the ***cell reference***. The first cell has the reference A1 for column A, row 1.
- You enter and edit information through the active cell. Only one cell can be active at a time. The active cell has a heavier border than other cells.
- You make a cell active by selecting it. If you select more than one cell, the first cell in the selection is the active cell.

Accessing the Toolbars

Overview
With Excel 5.0, come a variety of built-in toolbars used for a variety of purposes. Only the Standard and Formatting toolbars appear when Excel 5.0 is initially started. You can choose the **View Toolbars** command from the menu bar to display and hide your Excel toolbars. Several of these toolbars may be placed on the screen at the same time and they may be moved and placed on the screen in any form..

NOTE: With Excel 5.0, you can find out the name of each toolbar button by placing your mouse pointer on the button and holding it there for a couple of seconds. When you move the mousepointer, the button name disappears. This new feature is referred to as ***ToolTips***. Microsoft Word 6.0 offers this capability as well.

Lesson Concepts:

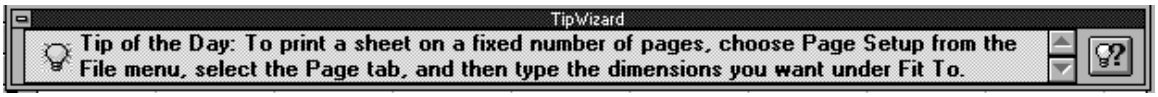
1. Select on the **View** menu.
2. Select **Toolbars**.
3. Select your desired settings.
4. Click **OK**.

The **Standard** toolbar contains the buttons most frequently used for formatting, file handling, and printing.

The **Formatting** toolbar contains buttons used for formatting fonts, applying basic character formatting and paragraph formatting.

The **Query and Pivot** toolbar contains buttons to help you create, update, and manipulate pivot tables.

The **Chart** toolbar contains the buttons to change the chart type, use the chart wizard, add or remove the legend, and apply gridlines.



The **Tip Wizard** toolbar displays a useful tip about Excel.

The **Drawing** toolbar contains buttons for drawing shapes, filling, reshaping, and grouping objects in the worksheet.

The **Forms** toolbar contains buttons with which you can draw and format controls such as check boxes, option boxes, and drop-down lists.

The **Stop Recording** toolbar contains a button to stop macro recording.

The **Visual Basic** toolbar contains buttons to assist you when programming in Visual Basic for Excel.

The **Auditing** toolbar contains buttons to help you find the common error in Excel worksheets.

The **Workgroup** toolbar contains buttons that are useful for working with others on a network.

The **Microsoft** toolbar has buttons that allow you to quickly switch to other Microsoft applications.

The **Full Screen** toolbar appears when you display the Excel workspace full-screen. You can click the button to return to the previous view.

Moving Around a Worksheet

Overview

- You can move around on a worksheet using either the mouse or keyboard.
- You see only one screenful of cells at a time. You can see another section of a worksheet by moving to that section using your cursor movement keys or by scrolling the contents of the window so that the section you want to see comes into view.
- Worksheets may also contain charts and text box areas in addition to data inside of cells.

Keyboard Shortcuts

Key	**Result**
Up Arrow	To move up one cell
Down Arrow	To move down one cell
Left Arrow	To move left one cell
Right Arrow	To move right one cell
PgUp	To move up one screen
PgDn	To move down one screen
Alt/PgUp	To move to the left one screen
Alt/PgDn	To move to the right one screen
Home	To move to Column A of the current row
Ctrl/Home	To move to cell A1
Ctrl/End	To move to the intersection of the last active row and the last active column in the worksheet
Enter	To move down one cell in the current column
Tab	To move to the right one cell
Shift/Tab	To move to the left one cell

EXERCISE

Task	Comments
1. Locate a new cell using the mouse.	Point and click on cell D6. Click on the up and down arrows on the vertical scroll bar. (Moves vertically by one row.) Click on the horizontal scroll bar between the scroll box and the scroll arrow. (Moves left or right one screen.) Drag a scroll box to the end of its scroll bar. (Moves to the top, bottom, left edge or right edge of the worksheet.)
2. Locate a new cell using the keyboard.	Press <**PgDn**>. Press the **DOWN** arrow key. Press the **RIGHT** arrow key. Press <**PgUp**>. Press <**Home**>.
3. Go to cell H55 using the GoTo key.	Press **F5**. Type **H55**, then press <**Enter**>.
4. Go to cell D15 using the Reference box.	Click inside of the reference box. Type **D15** and press <**Enter**>.
5. Return to Home (cell A1).	Press <**Ctrl**><**Home**>.

Entering Worksheet Information

Overview

- Worksheets accept four types of cell information: ***text***, ***numbers***, ***formulas, and functions***.

  Text can be any type of descriptive entry, including names, row and column headings, and notes. Text entries can include numbers. For example, 25 Pondview Drive and Tony Tully are text entries.

  Numeric entries contain combinations of the numbers 0 through 9. For example, 23, 254, and 5555 are all numeric entries. Numbers can stand alone or can be used in formulas to calculate values.

  Formulas consist of numbers, arithmetic operators, and cell references. All formulas must begin with an equal sign to identify it as a formula instead of a text entry.

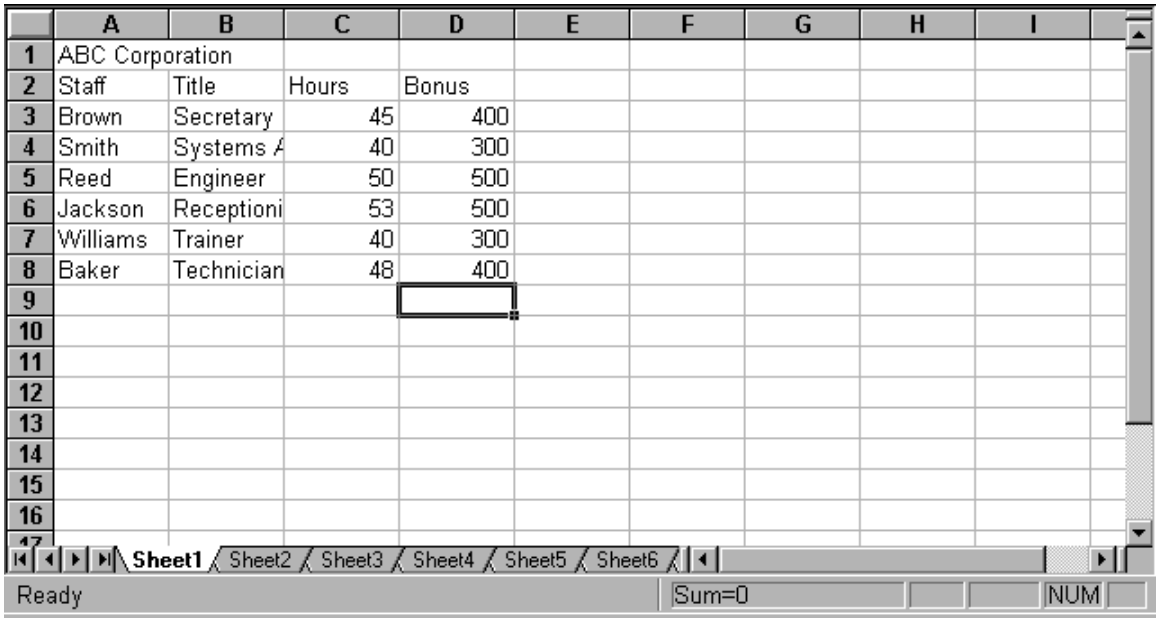
  Functions are built-in formulas that come with Excel.
- To accept information on a worksheet, you select a cell, type the data, and click the check mark on the formula bar. You can also press <**Enter**> to accept and move down one cell, press <**Tab**> to accept and move to the right one cell, or use the **arrow keys** to accept and move in the direction of the cursor movement key.
- When making an entry, text is automatically aligned to the left and numbers are aligned to the right. Entries may be changed by using the alignment icons.
- If a text entry exceeds the width of the cell and the right adjacent cell is empty, Microsoft Excel displays the excess text in the empty cell. If the adjacent cell is not empty, the display is truncated.
- If a number (General format only) exceeds the width of the cell, Microsoft Excel displays it in scientific notation. For example, 150,000,000 displays as 1.5E+08. If the number is not in general format and exceeds the width of the cell, the cell is filled with the number symbol "#".
- You can change and correct information by selecting a cell and editing the entry in the formula bar. To position the insertion point in the formula bar, click on the bar with your mouse pointer or press **F2**, the Edit key.
- You may also edit a cell by double-clicking on the cell, typing the new information, and pressing <**Enter>**.

Three buttons appear on the Formula bar when entering data.

Cancel  or press the <Esc> key	Erases the contents of the formula bar.
Accept  or press the <Enter> key	Places the contents of the formula bar into the active cell.
Function Wizard 	Assists with building fuctions.

EXERCISE

Task	Comments
1. Create a title.	Select cell **A1**, then type **XYZ Corp.**. (Do not press Enter.)
2. Change your title.	Click the **cancel** button. 
3. Retype your title.	Type **ABC Corporation**, then click the **accept** button. 
4. Enter a heading name.	Select cell **A2**, type **Staff**.
5. Highlight cell B2.	Click in cell **B2** with your mouse or press the **right** arrow key on your keyboard.
6. Enter some more heading names.	Type **Title**, then press <**Tab**>. Type **Hours**, then press <**Tab**>. Type **Bonus**, then press <**Enter**>.
7. Enter data into your worksheet.	Click in cell **A3**, type **Brown**. Continue entering the data from the following worksheet.

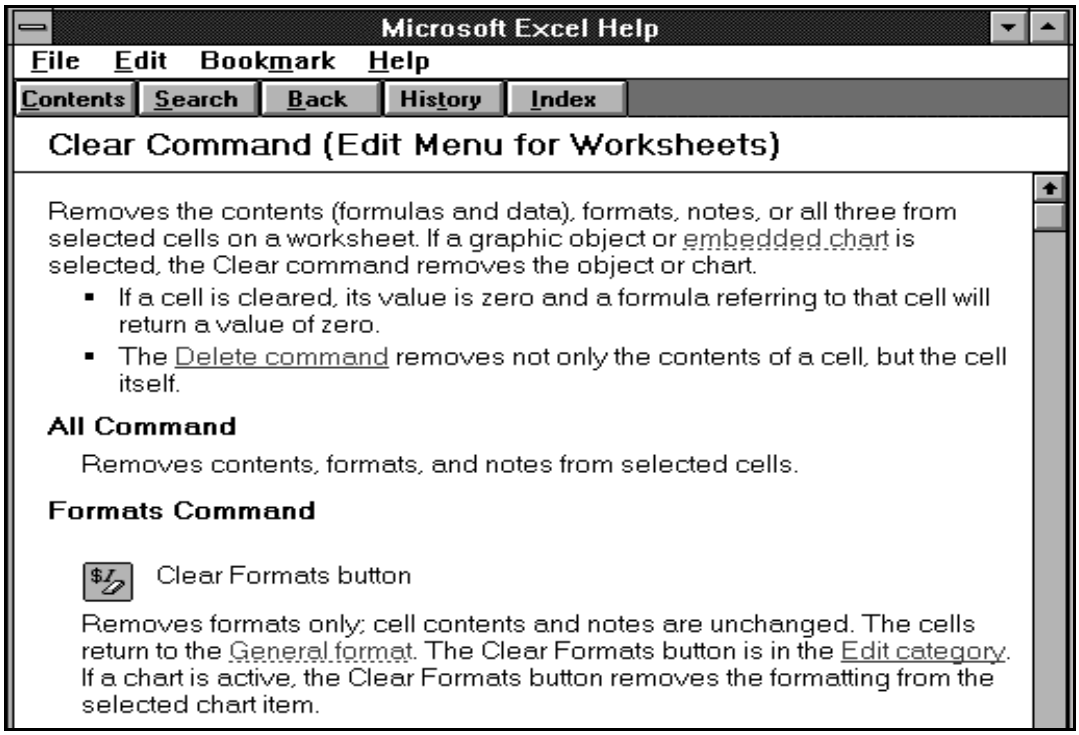


	A	B	C	D	E	F	G	H	I
1	ABC Corporation								
2	Staff	Title	Hours	Bonus					
3	Brown	Secretary	45	400					
4	Smith	Systems A	40	300					
5	Reed	Engineer	50	500					
6	Jackson	Receptioni	53	500					
7	Williams	Trainer	40	300					
8	Baker	Technician	48	400					
9									
10									
11									
12									
13									
14									
15									
16									

Cell B4 = Systems Analyst
Cell B6 = Receptionist

Using On-Line Help and Edit Undo

Overview



- If you start a command and change your mind, press <**Esc**>. Pressing <Esc> lets you clear entries from text boxes and exit the dialog box without making any selections.
- If you become confused or forget what a command does, on-screen Help is available. Microsoft Excel has general Help as well as context-sensitive Help that applies specifically to what you are currently doing. To display the Help window, press **F1** from the worksheet. To return to the worksheet, Select the **File** menu and choose **Exit**.
- Help window commands allow you to display an index of Help topics, print the definition of a topic, move easily between topics, or get help on how to use Help.

Help entries can include ***jump terms*** and ***glossary items.***

A jump term indicates that more information about a particular term or concept is available. To access the information, select the appropriate jump term and press <**Enter**> or click on it.

Glossary terms correspond to short, pop-up definitions. To access a pop-up definition click on the appropriate glossary term.

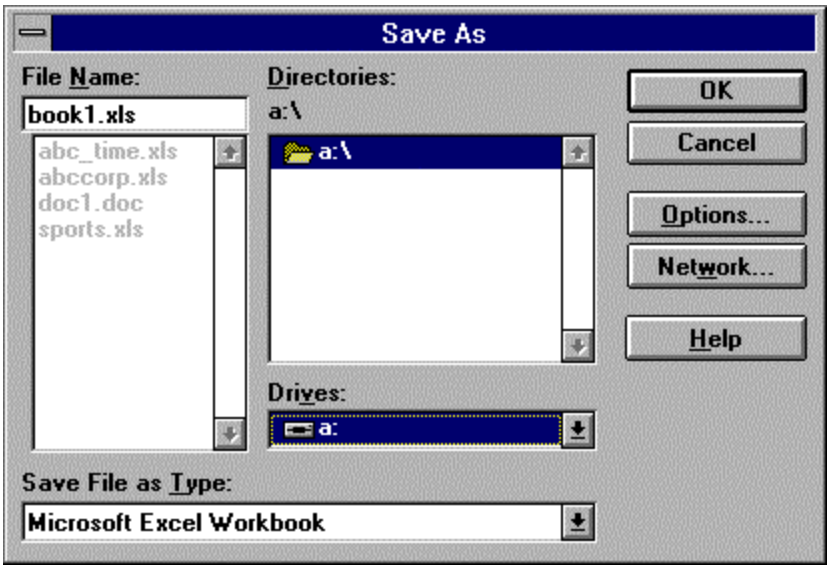
- If you make a mistake, the **Edit Undo** command lets you cancel your last command or action. The **Edit Redo** command lets you cancel your last Undo action.

EXERCISE

Task	Comments
1. Select cell C7.	Click on cell **C7**.
2. Display the side bar menu.	Choose the **Edit** menu and select **Clear**.
3. Display the MS Excel Help menu.	Press **F1** for context-sensitive help.
4. Display the Clear command help screen.	Click on the jump term for the **Worksheet Clear**.
5. View the definition.	Click on the glossary item, **Embedded Chart**.
6. Close the window.	Click again.
7. Exit Help.	Double-click on the Help control menu.
8. Verify that C7 is still selected.	Click on cell **C7**.
9. Delete the contents.	Select the **Edit** menu. Choose **Clear**, then **Contents**.
10. Restore the original value in cell C7.	Select **Edit** on the menu bar. Select the **Undo Clear** command.
11. Make changes to existing entries.	Move to cell **C7**. Type **58** and press <**Enter**>. Move to cell **D7**, type **500**, and press <**Enter**>.

Saving the Workbook

Overview



- When you open a new workbook, it is stored in computer memory only, and not on disk. The computer memory is cleared each time you turn off power to your computer. This means that if you make changes to a workbook and then turn off power to the computer without first saving the workbook, the changes you've made will be lost. To save your changes on disk, you must use the Save or Save As command on the File menu or the Save button on the Standard toolbar.
- A ***file*** in Excel is the same as a Workbook. Names for workbooks can be up to eight characters long. Microsoft Excel assigns your workbook a .XLS extension automatically.
- Save your work each time you finish a session. You should also save periodically during a session to protect against the unlikely event of a power failure or some other type of problem. Save new workbooks with the **File Save As** command so you can give them a name, and save existing workbooks with the **File Save** command or button. Use **Save As** also in the future if you wish to rename a workbook, or save it to another location.

- When you save a workbook, Microsoft Excel also saves the workbook settings, such as window sizes, plus any special formatting. This makes it easier for you to start working where you left off.

Lesson Concepts:

1. Select **File** on the menu bar.
2. Select **Save** or **Save As**.
3. Type in a filename.
4. Click **OK**.

EXERCISE

Task	Comments
1. Display the File menu.	Select the **File** command, or press **<Alt>F**.
2. Open the Save dialog box.	Select **Save** or press **S**.
3. Give your document a name.	Type **ABCCORP** for the filename, then click **OK**.

Notes:

- You can change the name of a workbook by saving a copy of the worksheet under a different name with the **File Save As** command and then deleting the original with the **File Find** command.
- You can use the **File Save As** command to keep different versions of a workbook by saving them under different names or by saving them to different locations.

If you choose the **File Close** command and had not just saved your work, a dialog box asking if you want to save or cancel your changes will be displayed. This dialog box also appears when you choose File Close or File Exit before saving your changes.

LESSON 2 EDITING & FORMATTING WORKSHEETS

LESSON 2: EDITING & FORMATTING WORKSHEETS

Data can be edited and fomatted in any cell. Cells may contain text, numbers, formulas, dates, times, error values, & logical values. An error value occurs when Excel cannot evaluate a formula in a cell. A logical value is a true or false result that appears in a cell when a condition is tested.

Data may be typed in the formula bar, located a the top of the workbook beneath the toolbar, or directly in a cell. Data that is longer than the cell it is typed in will be displayed across the adjacent cells procided those cells do not vonysin fsys. zig yhr sfjsvrny vrlld fo contain data, however, the cell that contains the long amount of data will be truncated.

Formatting an Excel worksheet allows for creativity on the users part. You can select different fonts, colors, bvorders, shading, cell widths, and cell heights to create fantastic looking documents.

LESSON 2: OBJECTIVES

At the end of this lesson you will be able to:

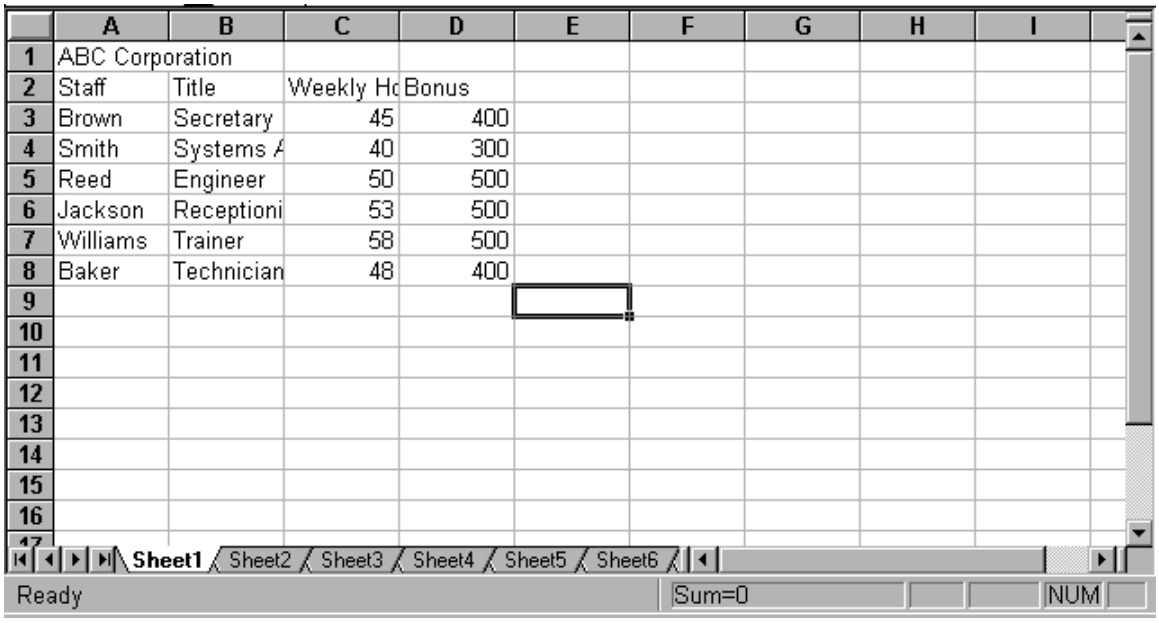
- Edit a worksheet
- Format columns
- Format rows
- Format cells
- Format text
- Format numbers
- Create fancy worksheets using AutoFormat

Editing a Worksheet

Cells in a worksheet may be edited by typing new information over existing information, or by double-clicking in the cell or formula bar to add additional information.

EXERCISE

Task	Comments
1. Make cell C2 active.	Click on cell **C2** with your mouse. (Hours appears in the formula bar.)
2. Activate the formula bar.	Press **F2** or click the mouse inside the formula bar.
3. Edit the heading to read Weekly Hours.	Place your cursor before the **H** in Hours, and type **Weekly**, then press your spacebar. Press <**Enter**> to store your entry.



Formatting Columns, Rows & Cells

Microsoft Excel makes it very easy for you to format the column width and row height. You can also very easily insert new rows and columns.

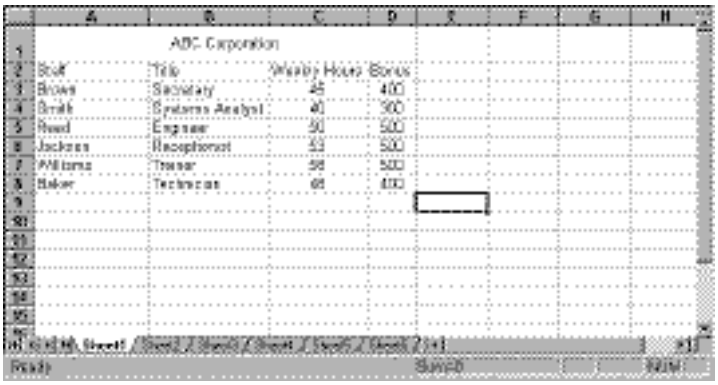
- Text defaults alignment to the left and numbers default alignment to the right. Both of these may be easily changed using the alignment icons on the Toolbar or by using the **Format Cells Alignment** command from the drop down menus.
- In addition to changing cell alignment, Excel also allows you to center align information that is within a range using the **Center Across Columns** button located on the Formatting toolbar.
- Excel can change the format of numbers as well. There are formats for dates, time, currency, scientific notations, accounting, fractions, and percentages.

EXERCISE

Task	Comments
Formatting Columns	
1. Increase the width of column C by dragging your mouse.	Move your mouse over the line separating column C and column D. Hold down your left mouse button when the pointer turns into a bar with an arrow on both sides. Drag your mouse to **width 13**.
2. Select the Entire Worksheet button.	Click once in the gray space to the left of column A, and above row 1. (The entire worksheet is highlighted.)
3. Use the Best-fit command to change the width of all columns in your worksheet.	Double-click on the column seperator between any of the columns.
4. Remove the highlight.	Click anywhere on your worksheet.

Task	Comments
Hide & Unhide a Column	
1. Select the column to be hidden.	Click on cell **B3.**
2. View the column menu.	Select **Format** on the menu bar, then select **Column**.
3. Hide the column.	Click **Hide**. (Notice the dark seperator between column headings A & C.
4. Unhide column B.	Highlight columns A and C. Select **Format** on the menu bar. Select **Column**. Choose **Unhide**.
Formatting Rows	
1. Resize a row by dragging the mouse.	Move the mouse pointer to the row seperator between 1 and 2. (The pointer becomes a bar with an arrow on the top and bottom.) Hold down the left mouse button and drag downward to a height of 24.
Aligning Cells	
1. Select the cells to align.	Highlight cells C3:D8.
2. Align these cells to the left.	Click on the left Alignment icon located on the Formatting toolbar. 
3. Align these cells to the right.	Click on the Right Alignment icon. 
4. Center align these cells.	Click on the Center Alignment icon. 

Task	Comments
Inserting & Deleting Columns & Rows	
1. Insert an additional column between columns C and D.	Click on the column D heading. (The entire column is highlighted.) Select **Insert** on the menu bar, then select **Columns**.
2. Delete the new column.	Highlight the column. Select **Edit** on the menu bar, then **Delete**.
3. Insert a Row.	Highlight row 5 by clicking on the row number. Select **Insert**, then select **Rows**.
4. Delete the new row.	Verify that the row is still selected. Select **Edit**, then **Delete**.
Centering Text within a Range.	
1. Center the title across columns A through D.	Highlight cells A1 to D1. Click on the Center Across Columns button. 
2. Center text vertically.	Select row heading 1. Select **Format** on the menu bar. Select **Cells**, **Alignment**. Click **Center** in the **Vertical** box.
3. Remove the highlight.	Click **OK**. Click anywhere on your screen.
4. Save your file.	Click on the **Save** button. 



Formatting Text

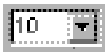
You can give a worksheet a desktop publishing look by changing fonts, adding borders and underlines, applying patterns, etc.

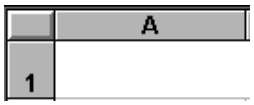
Changing Character Fonts, Sizes, Styles, and Colors
Fonts are the different typefaces that you see in printed materials. ***Font sizes*** are measured in points, and there are 72 points per inch. Fonts also appear in ***font styles*** such as bold, underline, italic, plain, and strikethrough. You may also change the color of your font. Colors will appear on your screen but will only print out if you have a color printer.

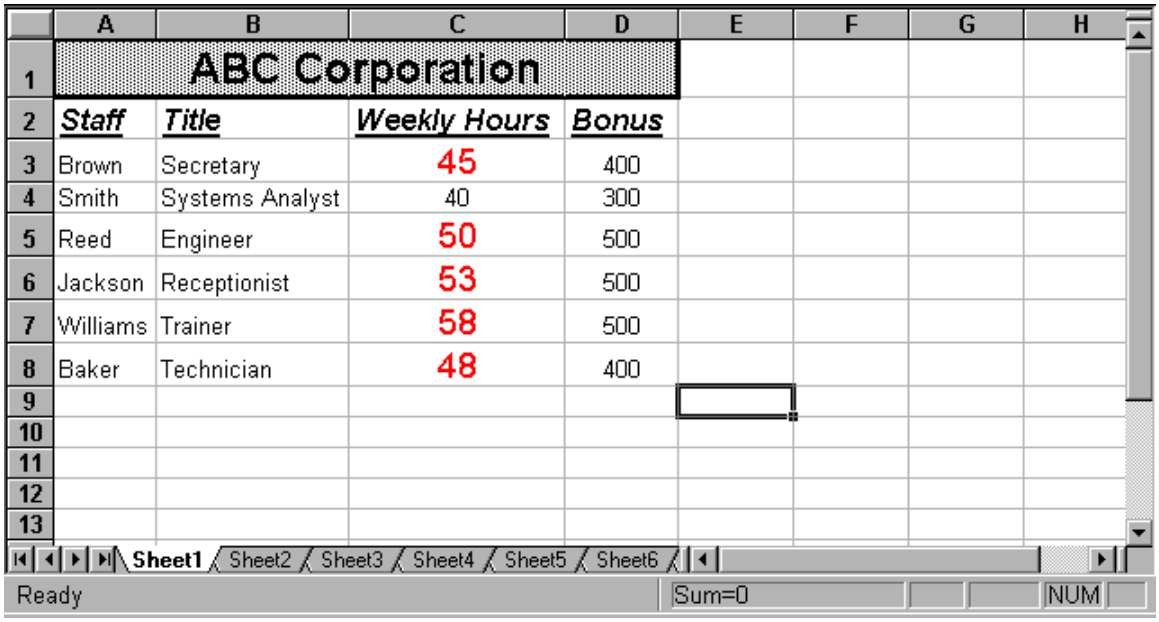
Applying Borders and Patterns
Patterns and borders can dress up your worksheet to make important information stand out more. You can add emphasis and pizzazz to your worksheet by using a mixture of different shadings and patterns as backgrounds for rows of numbers and titles. There are 18 black and white patterns available. You can also create shadings by using foreground and background colors within a pattern. These patterns will still print out black and white though unless you have a color printer.

EXERCISE

Task	Comments
1. Select several non-adjacent cells.	Click on cell **C3**. Hold down <**Ctrl**> on your keyboard and click cells **C5**, **C6**, **C7** and **C8**.
2. Display the Font dialog box.	Select **Format** on the menu bar. Click **Cells**, then **Font**.
3. Change the Font type and size.	Choose **Arial** for the Font type.

Task	Comments
	Choose **14** for the Font size.
4. Change the color of the text.	Click on the arrow in the **Color** box. Select a color of your choice. Click **OK**.
5. Remove the highlight.	Click anywhere on your worksheet.
6. Select your title.	Highlight cells **A1** to **D1**.
7. Place a border around your title.	Select **Format** on the menu bar. Click **Cells**, **Border**, then **Outline** for the type of border. Select the last line style in the first column.
8. Place a pattern in your title box.	Click **Patterns**, press <**Tab**>. Click on the arrow in the Patterns list box. Choose the fourth pattern in the first row from the left, then click **OK**.
9. Remove the highlight.	Click anywhere on your worksheet.
10. Make the title larger.	Highlight cells **A1**. Click the arrow in the **Font Size** box on the toolbar.  Select **18**.
11. Make the title bold.	Click the **bold** button on the toolbar. 
12. Make the heading 13 point.	Highlight cells **A2** to **D2**. Click in the **Font Size** box. Type **13**, then press **Enter**.
13. Make the headings bold, italicized & underlined	Click the **bold** button. Click the **italicize** button.  Click the **underline** button. 
14. Increase the width of the columns.	Click on the **Entire Worksheet** button.

Task	Comments
	 Double-click between column headings.
15. Remove the highlight.	Click anywhere on the screen.
16. Save this file.	Click the **Save** button. 



	A	B	C	D	E	F	G	H
1	ABC Corporation							
2	*Staff*	*Title*	*Weekly Hours*	*Bonus*				
3	Brown	Secretary	45	400				
4	Smith	Systems Analyst	40	300				
5	Reed	Engineer	50	500				
6	Jackson	Receptionist	53	500				
7	Williams	Trainer	58	500				
8	Baker	Technician	48	400				
9								
10								
11								
12								
13								

Sheet1 Sheet2 Sheet3 Sheet4 Sheet5 Sheet6

Ready Sum=0 NUM

Formatting Numbers

Microsoft Excel has predefined numeric and date/time formats that it uses by default. You may enter a number in a cell that does not appear as it was entered. This is because Excel has changed it to its default format. You can change the formatting of any number by using the **Format Cells Number** command from the menu bar. You may also customize your own number formats. If a cell displays a bunch of # signs, it is because the column is not wide enough. Widening the column corrects this situation.

EXERCISE

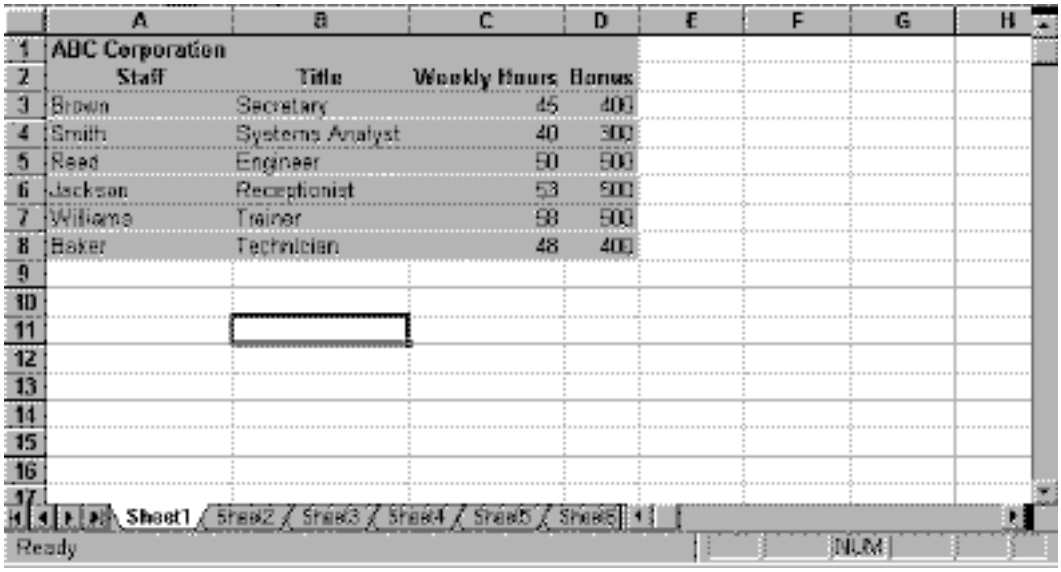
Task	Comments
1. Open a new sheet.	
2. Type todays date.	
3. Change the format fo the data to appear with slashes.	Select **Format** on the menu bar. Select **Cells**, then **Number**, then **Date**. Select **m/d/yy**, then click **OK**.
4. Change the format of the data to appear spelled out.	Select **Format** on the menu bar. Select **Cells**, then **Number**, then **Date**. In the **Code** box, type **mmmm dd, yyyy**. Click **OK**.
5. View your custom formats.	Highlight cell **A5**. Select **Format** on the menu bar. Select **Cells**, **Number**, **Custom**.
6. Create a new percentage format.	Click **Percentage**. In the **Code** box, type **0.0**. Click **OK**.
7. Use your new percentage code.	Type **5.27**, then press , <**Enter**>. (It changed to 5.3 automatically.) Click on cell **B5**, and type **6.27**, then <**Enter**>. (It did not change, because the cell was not formatted.) Click your right mouse button on cell **B5**. Select **Format** on the menu bar. Select **Cells**, then **Custom**. Highlight **0.0**, then click **OK**.

Using the AutoFormat Feature

Microsoft Excel has built-in table formats that can be used to format any selected worksheet. These formats will change the appearance of your table by applying fonts, borders, color, patterns, shading, lines, numbers, column height, and row height to your table.

EXERCISE

Task	Comments
1. Highlight the entire table.	Click on cell **A1**, then hold down the <**Shift**> key and click on cell **D8**.
2. Open the Autoformat dialog box.	Select **Format** on the menu bar. Click **AutoFormat**.
3. View the different table formats.	Click on a format name in the **Table Format** box. Click another name to look at another format.
4. Select a table format.	Click on **Colorful2**, then click **OK**.
5. Remove the highlight.	Click anywhere on the worksheet.
6. Remove the format.	Select **Edit** on the menu bar. Select **Undo AutoFormat**.
7. Select another format.	Select **Format** on the menu bar. Select **AutoFormat**. Choose **3D Effects 2**, then click **OK**.
8. Remove the highlight.	Click anywhere on the worksheet.
9. Save the file.	Click on the **Save** icon.


ABC Corporation
Staff
Title
Weekly Hours
Bonus
Brown
Secretary
45
400
Smith
Systems Analyst
40
300
Reed
Engineer
50
500
Jackson
Receptionist
53
500
Williams
Trainer
38
500
Baker
Technician
48
400
Sheet1
Sheet2
Sheet3
Sheet4
Sheet5
Sheet6
Ready
NUM

LESSON 3 FORMULAS & FUNCTIONS

LESSON 3: FORMULAS & FUNCTIONS

The main feature to using Microsoft Excel is the use of formulas and functions. These are calculations that are done electronically by the computer instead of manually on paper or using a calculator. The actual formula appears in the formula bar, while the calculated result appears in a cell. All formulas in Excel begin with an equal (=) sign and can contain arithmetic operators, parenthesis, cell references, text operators, functions, names, and numbers.

Formulas and functions are very much the same, except that functions use arguments in order to gain a result. These results can include text, logical values, references, and information about the worksheet. Functions can many times be faster than formulas and are sometimes considered short-cuts.

LESSON 3: OBJECTIVES

At the end of this lesson you will be able to...

- Create formulas
- Work with functions
- Use the AutoSum feature
- Use the Function Wizard
- Link & consolidate worksheets with functions
- Work with ranges

Creating a Formula

- You use formulas to perform mathematical operations. Microsoft Excel can perform all of the basic mathematical operations (addition, subtraction, multiplication, and division) plus many more sophisticated operations (for example, average, SIN, and COS).
- Formulas are typed and edited in the formula bar at the top of the worksheet window.
- You always start a formula with an equal sign (=).
- Basic formulas are made up of cell references (for example, C3 and C4), numeric values (for example, 2 and 10), and arithmetic operators listed below.

+	for addition
-	for subtraction
*	for multiplication
/	for division
^	for exponents

Below are several sample formulas:

=A1+A2 =D4*2 =C3-C4 =B5/10 =4^3

- When you enter a formula into a cell, Microsoft Excel displays the value of the formula in the worksheet, and the formula itself in the formula bar. For example, suppose the value of C3 is 6 and the value of C4 is 7. If you enter the formula =C3+C4 into cell C5, then 13 will display as the value of cell C5 on the worksheet and =C3+C4 will display in the formula bar when cell C5 is active.
- You can enter cell references in a formula quickly by selecting those cells on the worksheet. For example, if you wanted to enter the formula **=**C6+E12, you could type the equal sign (=), select cell C12, type a plus sign (+), and then select cell E12. This is especially convenient for mouse users.

- When you start building more sophisticated formulas, you will need to consider the precedence Microsoft Excel assigns to each operator. Precedence refers to the order in which Microsoft Excel performs calculations for formulas that contain more than one operator. The specific sequence that Excel follows when it performs calculations is as follows:

  Parenthesis: Calculations that are enclosed in parenthesis inside another set of parenthesis are performed first.

  Exponents: Calculations involving exponential numbers are performed next.

  Multiplication and Division: These operations are performed next. Because they are equal in the order that they are performed, they are performed in the order in which they are encountered (from left to right).

  Addition and Subtraction: These operations are performed last. They are also performed in the order in which they are encountered (from left to right).

EXERCISE

Task	Comments
Calculate an addition formula	
1. Create a Total heading.	Click in cell **A10** and type **Total** Press <**Tab**> twice.
2. Create a formula to Add the weekly hours.	In cell **C10.** Type an equal sign **(=).** Click on cell **C3** and type a plus sign **(+).** Select cell **C4** an tyupe a plus sign **(+).** Repeat this process until your formula looks like this: **=C3+C4+C5+C6+C7+C8** Press <**Enter**>.
3. Center column C.	Select cells **C3:C10**. Click the **center align** button.
4. Remove the highlight.	Click anywhere on the worksheet.

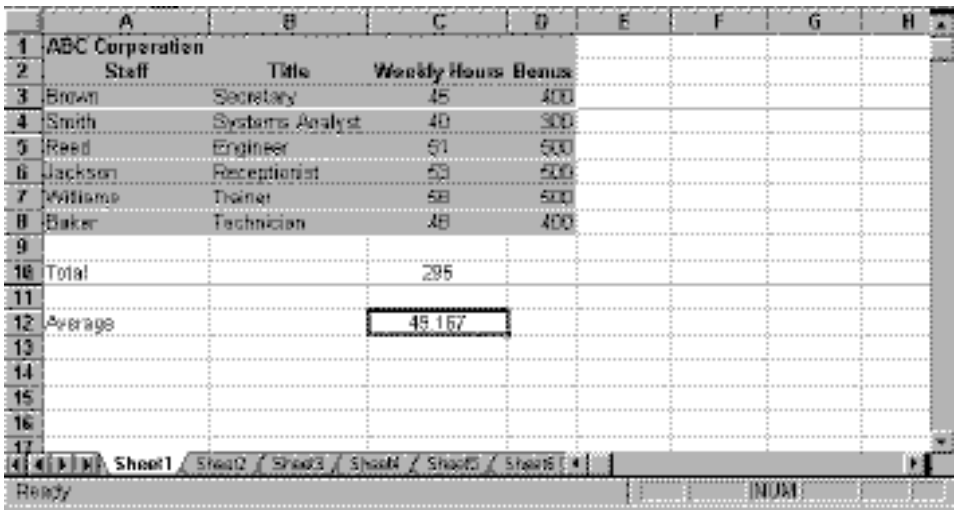
	A	B	C	D	E	F	G	H
1	**ABC Corporation**							
2	**Staff**	**Title**	**Weekly Hours**	**Bonus**				
3	Brown	Secretary	45	400				
4	Smith	Systems Analyst	40	300				
5	Reed	Engineer	50	500				
6	Jackson	Receptionist	53	500				
7	Williams	Trainer	58	500				
8	Baker	Technician	48	400				
9								
10	Total		294					
11								
12								
13								
14								
15								
16								
17								

Sheet1 | Sheet2 | Sheet3 | Sheet4 | Sheet5 | Sheet6

Ready NUM

EXERCISE

Task	Comments
Calculate a weekly average	
1. Create a formula to average the number of hours worked by all staff members.	Select cell **C12**. Type an equal sign **(=)** to start the formula. Type **C10/6** (total office hours for the month divided by the number of staff members). Press <**Enter**>.
2. Change Reed's hours to 51.	Highlight cell **C5** and type **51**. Press <**Enter**>.
3. Use the Decrease Decimal button on the Formatting toolbar to decrease the average to three decimal places.	Highlight cell **C12**. Click the **Decrease Decimal** button 5 times.
4. Add a heading for this line.	Select cell **A12**, type **Average**, and press <**Enter**>.
5. Center cell C12.	Highlight cell **C12** and click the **Center align** button.



Working with Functions

- A ***function*** is a predefined formula that can be used as a shortcut for worksheet calculations. Excel provides over 300 of these built-in formulas. Functions are divided into groups including logical, financial, mathematical, and accounting. All functions have the same syntax, which consists of an equal sign (=), the function name, an opening parenthesis, the arguments, and a closing parenthesis. An example of the syntax is shown below.

  =FunctionName(arguments)

- ***Arguments*** are data a function uses to produce a value. Most function arguments contain a singe cell address or range of cell addresses.

- You can use functions alone or as part of a formula.

- Below is a sample list of functions:

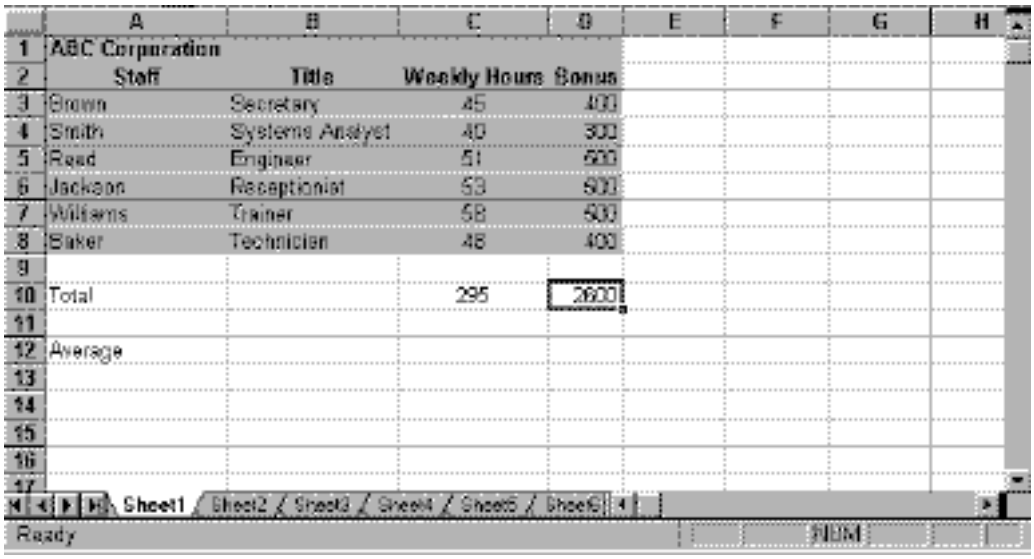
  - =SUM(B1:B5)
  - =AVERAGE(H5:H10)
  - =MAX(B6:B12)
  - =MIN(C1:C6)

AutoSum Feature

The **AutoSum** button is a quick option used to add a column or row of sequential numbers. When selecting the AutoSum button the SUM formula appears in the formula bar. It may also be used to quickly insert the SUM formula.

EXERCISE

Task	Comments
1. Clear the totals.	Highlight cells **C10** to **C12**. Click your right mouse button. Click **Clear Contents**.
2. Calculate the sum of the hours.	Select cell **C10**. Double click on the **AutoSum** button in the Standard toolbar. Σ
3. Calculate the sum of the Bonus'	Select cell **D10**. Double-click on the **AutoSum** button.
4. Save the workbook.	Click on the **Save** icon.
5. Close the workbook.	Select **File** on the menu bar. Select **Close**.



	A	B	C	D	E	F	G	H
1	ABC Corporation							
2	Staff	Title	Weekly Hours	Bonus				
3	Brown	Secretary	45	400				
4	Smith	Systems Analyst	40	300				
5	Read	Engineer	51	600				
6	Jackson	Receptionist	53	900				
7	Williams	Trainer	58	500				
8	Baker	Technician	48	400				
9								
10	Total		295	2600				
11								
12	Average							
13								
14								
15								
16								
17								

Sheet1 / Sheet2 / Sheet3 / Sheet4 / Sheet5 / Sheet6

Ready NUM

The Function Wizard

The ***Function Wizard*** can increase your accuracy and efficiency when entering difficult functions. The Function Wizard allows you to select a function and then choose from a list of arguments.

There are two steps to complete the process of using the Function Wizard.

Step 1 of 2 — Allows you to choose a function category and name. At the bottom of the box is a description of the function name that is selected.

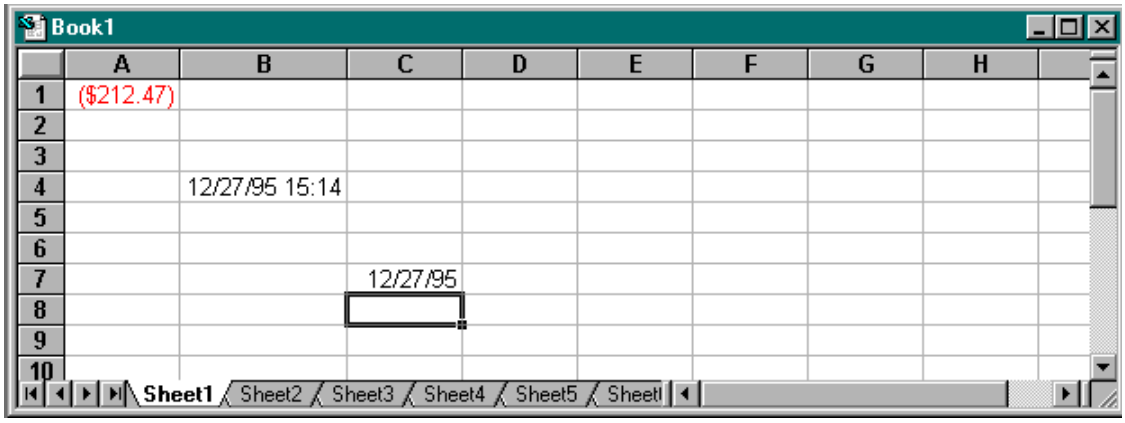
Step 2 of 2 — This step again shows a description of the funtion selected. There may also be boxes for entering data. Above these boxes is a description of what should be included. Some of the boxes will require data to be entered. The titles of these boxes will be bold and the description will show required. Depending on the function name selected, you may not have to enter any data.

Type in the necessary information then click the Fincish button. Your answer will appear in the cell you began the function.

EXERCISE

Task	Comments
1. Open a new workbook.	Click on the **New Workbook** button. 
2. Create a function for determining monthly payments on a loan.	Highlight cell **A1**. Click on the **Function Wizard** button.  Click on **Financial**. Select **PMT**, then click **Next**. Type **.10/12** in the rate box, Press <**Tab**>. Type **60** in the nper box, then <**Tab**>. Type **20000** in th pv box. Click **Finish**.
3. Change the amount of the loan to $15,000	Highlight cell **A1**. Click on the formula in the Formula toolbar. Change 20000 to **15000**, then press <**Enter**>.

Task	Comments
4. Change the amount of the loan to $10,000.	Highlight cell **A1**. Click the **Function Wizard** button. Change 15000 to **10000**.
5. Use a function to determine the current date & time.	Highlight cell **B4**. Click on the **Function Wizard** button. Click on **Date & Time**. Select **Now**, then click **Next.** Click **Finish**.
6. Widen the column.	Double-click on the column separator between columns B & C.
7. Manually type in the formula for todays date.	Highlight cell **C7**. Type **=today()** Press <**Enter**>.
8. Close this workbook. Do not save.	Select **File** on the menu bar. Select **Close**, then **No**.



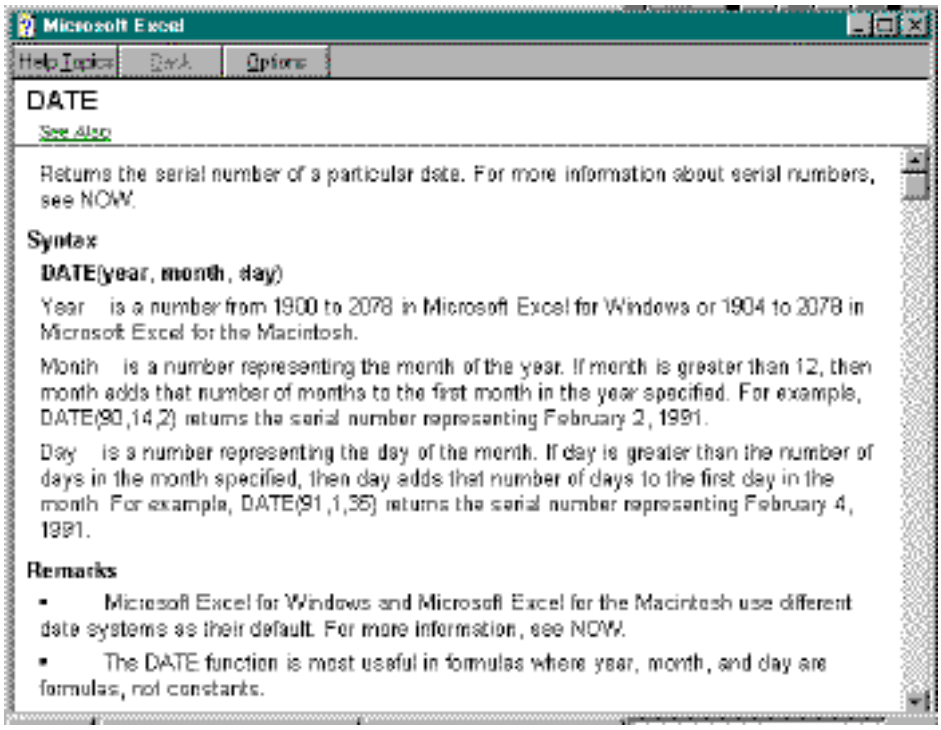
Getting Help for Functions

Excel contains extensive on-line help for functions. If you are using the Function Wizard, you can click on the Help button located at the bottom left of the Function Wizard dialog box to get general function help. To get specific help on a function that you are trying to create, select the name of the function, then click on the Help button.

You may also access help on functions, by selecting the Help menu on the main Excel menu bar, typing in **Functions, Worksheet** in the top text box, or you can type the name of a specific function you want help with; then choose **Show Topics**. Select a more specific topic from the lower window, then choose **Go To** to display a help window on that topic.

EXERCISE

Task	Comments
1. Open a new workbook.	Click on the New Workbook button. 
2. Open the Help dialog box while using the Function Wizard.	Click on the **Function Wizard** button.  Click on **Help**.
3. Get information on the PMT function.	Click **Search**. Type **PMT** in the blank box. Click **Show Topics**, then **Go To**.
4. Close the help box.	Select **File** on the menu bar. Click **Exit**.
5. Close this workbook.	Click the **Cancel** button. Select **File** on the menu bar. Click **Close**.


Microsoft Excel
Help Topics
Back
Options
DATE
See Also
Returns the serial number of a particular date. For more information about serial numbers, see NOW.
Syntax
DATE(year, month, day)
Year is a number from 1900 to 2078 in Microsoft Excel for Windows or 1904 to 2078 in Microsoft Excel for the Macintosh.
Month is a number representing the month of the year. If month is greater than 12, then month adds that number of months to the first month in the year specified. For example, DATE(90,14,2) returns the serial number representing February 2, 1991.
Day is a number representing the day of the month. If day is greater than the number of days in the month specified, then day adds that number of days to the first day in the month. For example, DATE(91,1,35) returns the serial number representing February 4, 1991.
Remarks
• Microsoft Excel for Windows and Microsoft Excel for the Macintosh use different date systems as their default. For more information, see NOW.
• The DATE function is most useful in formulas where year, month, and day are formulas, not constants.

Linking and Consolidating Worksheets with Functions

3-D references are used to reference cells in multiple adjacent worksheets within a workbook. You can refer to other sheets of a workbook by including a sheet reference and a cell reference in a formula. For example, if you wanted to refer to cell B2 on Sheet1, you would enter Sheet1!B2 in the formula. If the sheet has a name, use the name instead of Sheet1 and then the cell reference.

You can also use the mouse to enter a reference to a cell or range on another worksheet in a workbook. To do this, start entering the formula in the cell where you want the result to appear, and then click the tab of the worksheet with the cell or range that you wish to refer to. Next, select the cell or range that you want to refer to. The complete reference now is displayed in the formula bar.

EXERCISE

Task	Comments
1. Open the file ABCCORP.	Click on the **Sheet2** tab at the bottom of the screen.
2. Link the total hours from sheet1 to cell C4 on sheet2.	Select cell **C4** on the **Sheet2** worksheet. Type **=sum(.** Click on the **Sheet1** tab and select cell **C10**. Click the **Accept** button.
3. Change Brown's weekly hours to 66 in the Sheet1 worksheet.	Click on the **Sheet1** tab. Highlight cell **C3**. (Notice the value in cell C10 is 295.) Type **66**, and press <**Enter**>. (Notice the total changed from 295 to 316).
4. View the change in the Sheet2 worksheet.	Click on the **Consolidate** tab.

Working with Ranges

- Before you perform an action in Microsoft Excel, you specify which cells you want the action to affect. You can select individual cells, cell ranges, rows or columns, or the entire worksheet.
- You can specify a cell range by typing the references for the first and last cell in the range and then separating them with a colon (:). For example, B4:C10 specifies the range of cells from B4 through C10.
- You can copy contents from one cell to another with the **Edit Copy** and **Edit Paste** commands. When you copy cell contents, all formulas, formatting, text, and numbers copy to the new cell, replacing the original contents of that cell.
- You can also fill adjacent cells with the formula and formatting used in a specific cell. To do this, you use the **Edit Fill** commands.
- Cell entries can be copied or filled to a single cell or to a range of cells.
- If a cell contains a formula that contains ***relative*** cell addresses, Microsoft Excel automatically adjusts the cell references for the new row or column when you copy or fill the cell. Relative cell references maintain their relative position to one another when copied. For example, if a formula calculates the total of three items in column B (=B1+B2+B3), and you copy that formula to an adjacent cell in column C, the column references are adjusted automatically (=C1+C2+C3).
- If a cell contains a formula that has ***absolute*** cell addresses, Microsoft Excel will not change the absolute cell references when copied. For example, in cell C9 you have the formula (=C7/$F$7). If you move this formula to D9, the formula changes to (=D7/$F$7). When you copy a formula with an absolute cell address, the absolute part of the address does not change.

Selecting using the Keyboard	
To Select:	**Keystrokes**
A range of cells to the right	<Shift>+Right Arrow
A range of cells to the left	<Shift>+Left Arrow
An entire column of cells	<Ctrl>+Spacebar
An entire row of cells	<Shift>+Spacebar
The entire worksheet	<Ctrl>+<Shift>+Spacebar
A range of cells	Press F5 (Goto key) or click in the Name box and enter the range that you wish to select. For example entering C5:K30, will highlight cells C5 thru K30.

Selecting using the Mouse	
To Select:	**Mouse Action**
A range of cells	Select one corner of the range and drag the mouse button to the opposite corner of the range. You may also select one corner of the range; move the mouse pointer to the opposite corner; and press and hold the <Shift> key before clicking.
Multiple nonadjacent ranges of cells	Select the first range, press and hold the <Ctrl> key before selecting any other ranges.

Naming Ranges

A ***range name*** refers to a cell, a group of cells, a value, or a formula. After a name is defined in a workbook, you can use them to move quickly to a specific area of the workbook. You can also use these names in formulas.

Using Range names in formulas

You can create a function by using a defined name that refers to the cell or cells that you want to use in the arguments. For example, =SUM(OFFICE_HRS) can refer to a range of cells that have been defined as OFFICE_HRS. The range names can either be typed into a function or selected from the Name box.

Lesson Concepts:

1. Select the range on your worksheet that you wish to name.
2. Choose the **Insert** menu and select **Name/Define**.
3. Type a name for the range. Range names can be up to 255 characters long but cannot contain spaces.
4. Click on the **Add** button.
5. Click on **OK**.

EXERCISE

Task	Comments
1. Activate the Sheet1 worksheet.	
2. Select the range of cells to be linked.	Highlight cells **D3:D8**.
3. Give the range a name.	Select **Insert** on the menu bar. Select **Name**, then **Define**. Type **Bonuses**. Click **OK**.
4. Display the Sheet2 worksheet.	Click on the **Sheet2** tab.
5. Link the bonuses to Sheet2.	Highlight cell **A4**. Type **=sum(**. Click on the down arrow in the **Name** box. Select **Bonuses**. Press **Enter**.
6. Save this file.	Click the **save** button.

LESSON 4 WORKING WITH WORKBOOKS

LESSON 4: WORKING WITH WORKBOOKS

A Microsoft Excel workbook is a file that contains several worksheets consisting of charts, slides, macros, and databases all grouped together. You may have up to 255 sheets in any given workbook.

When a workbook is opened, all fo the worksheets it contains is also opened. By default, a workbook will contain 16 worksheets, but this number can be changed in the **Tools Options** menu on your menu bar.

LESSON 4: OBJECTIVES

At the end of this lesson you will be able to...

- Copy and move worksheets between workbooks
- Rename Sheet tabs
- View multiple sheets of a workbook at the same time
- Move & copy information
- Use AutoFill
- Preview a document
- Print a document

Copying and Moving worksheets between workbooks

When you open an Excel 4.0 worksheet file in Excel 5.0, it is automatically converted to an Excel 5.0 file with a single worksheet. Both the workbook and the single worksheet are given the name of the original worksheet. Likewise, when you open an Excel 4.0 chart or macro sheet, a new workbook with a single chart or macro sheet is created.

You can open up two or more workbooks on your desktop and click and drag worksheets from one workbook to another. Clicking and dragging will move sheets between workbooks, whereas pressing the <**Ctrl**> key, and then clicking and dragging, will copy sheets between windows.

You can also select the sheet tab and press the right mouse button and select copy or move. If you use this method, you do not have to have the workbook that you are copying to opened. A dialog box is displayed where you can list the workbook and sheet that you wish to copy or move to.

EXERCISE

Task	Comments
1. Select the Sheet1 worksheet.	Click on the **Sheet1** tab.
2. Open a new workbook.	Click the **New Workbook** button.
3. Arrange the two files on your screen to be seen at the same time.	Select **Window** on the menu bar. Select **Arrange**. Choose **Tiled**, then click **OK**.
4. Move Sheet1 in the ABCCORP workbook to the new workbook.	Hold down the left mouse button on the **sheet1** tab, in the **ABCCORP** workbook, then drag it to the **Sheet1** tab in the new workbook.
5. Move Sheet1 back to ABCCORP.	Drag the **Sheet1** tab to the **Sheet2** tab in the ABCCORP workbook.

Renaming Sheet tabs

Sheet tabs can have up to 31 characters, including spaces. You can use any of the methods described below to rename a worksheet.

- Select the sheet and use the **Format Sheet Rename** command.
- Double-click on the worksheet tab.
- Select the sheet and press the right mouse button to bring up a short menu.

EXERCISE

Task	Comments
1. Display the Rename Sheet dialog box.	Double-click on the **Sheet1(2)** tab on the **ABCCORP** workbook.
2. Rename the sheet.	Type **Staff Bonus** and click **OK**.
3. Close the new workbook.	Click once on the new workbook to make it active. Select **File** on the menu bar. Click **Close**, then **No**.
4. Maximize ABCCORP.	

Viewing multiple sheets of a workbook at the same time

By default, you can see only one sheet of a workbook at a time. To bring another sheet of a workbook into view, you can either click on the worksheet's tab or press **<Ctrl><PgDn>** for the next sheet or **<Ctrl><PgUp>** for the previous sheet. Bringing another sheet into view, hides the sheet that was visible previously.

The New Window command allows you to view multiple sheets of the same workbook at the same time. First, you open a new window for each worksheet. Then, you can use the Worksheet tabs of each window to bring a different sheet into view.

Multiple views will have the same filename, but will add a colon along with a view number. For example, a second view title will end with a colon and the number 2. A third view will end with a colon and the number 3, and so on.

EXERCISE

Task	Comments
1. Display the ABCCORP workbook twice.	Select **Window** on the menu bar. Select **New Window**. (Notice the tile bar).
2. Arrange the views on your screen.	Select **Window** on the menu bar. Select **Arrange**, then **Tiled**, then click **OK**.
3. View two different files at the same time.	Click the **Sheet2** tab in the **ABCCORP** file.

Moving and Copying information

You can move and copy data among worksheets, workbooks, or even other applications. Use the command ***Edit Copy*** to copy data and ***Edit Cut*** to move data. To insert the data in another location, use ***Edit Paste***. Note that when you paste the contents of cells, you overwrite the existing cell contents.

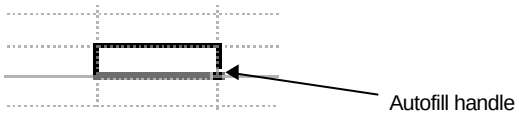
EXERCISE

Task	Comments
Copying data in the same sheet, then in a different sheet.	
1. Open the file ABCCORP.	Select **File** on the menu bar. Select **ABCCORP**.
2. Copy row 3 to row 8.	Click on row heading 3. Select **Edit** on the menu bar, then select **Copy**. Select row heading 9 and press <**Enter**>, or choose Insert on the menu bar, then select **Copied Cells**. (Notice the totals were recalculated.)
3. Remove this paste.	Select **Edit** on the menu bar. Click **Undo**.
4. Copy row 10 to row 11.	Click on row heading 10, then Select **Edit** on the menu bar. Select **Copy**. Select row heading 11 and press <**Enter**>. (The formulas were copied also.)
Copying the contents of one cell to a range of cells.	
1. Place a sum total in cell E6.	Click in cell **E3**. Double-click the **Autosum** button. 
2. Copy the formula down to cell E8.	Highlight cells **E3:E8**. Select **Edit** on the menu bar. Select **Fill**, then choose **Down**.

AutoFill

The AutoFill feature gives you the ability to fill in the labels for the months in a year or days of a week. It can fill in almost anything that belongs to a series. It also repeats numbers if the numbers are preceded by text. A series can be created by using the fill handle of the cell that contains the first item in the series and then dragging to where you wish to end the series.

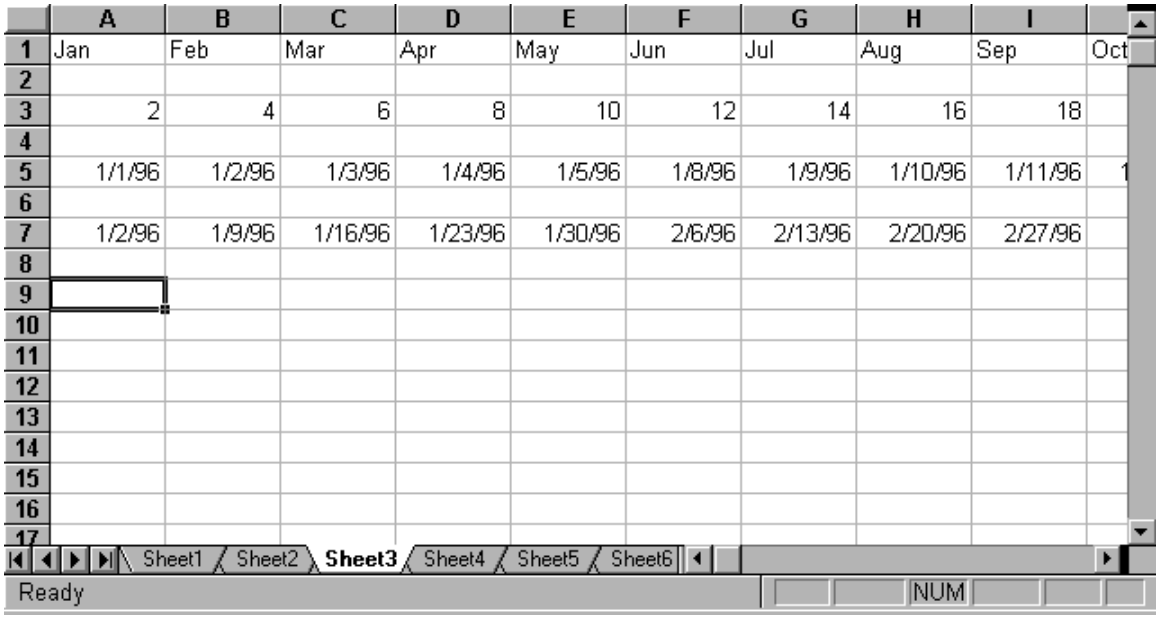
You need to setup a schedule for the next twelve months at the bottom of the worksheet. You will use the AutoFill feature to create the schedule.



EXERCISE

Task	Comments
Create a series using the Autofill handle	
1. Go to a new sheet.	Click on the **Sheet3** tab.
2. Enter the months of the year in cells A1 through L1.	Type **Jan** in cell A1. Hold down your left mouse button on the Autofill handle and drag to cell **L1**.
3. Go to cell A1.	Press <**Ctrl**> and <**Home**> on your keyboard.
4. Enter only even numbers on a row.	In cell A3 type **2**. In cell B3 type **4**. Press <**Enter**>. Highlight cells **A3** and **B3**. Hold down the left mouse button on the Autofill handle and drag to cell **L3**.
Create a series using the menu bar	
1. List every weekday of a month.	In cell A5, type **1/1/96** or **Jan. 1**. Press <**Enter**>. Highlight cell **A5**. Click on **Edit** on the menu bar. Select **Fill**, then **Series**. Change the Type to **Date**. Select **Weekday** in the Date Unit box. Enter **1/31** as the Stop value. Click **OK**.
2. List every Tuesday in the year.	In cell A7, type **1/2/96**, then <**Enter**>.

Task	Comments
3. Close this file. Do not save.	Highlight cell **A7**. Select **Edit** on the menu bar. Select **Fill**, then **Series**. Select **Date** for the Type. Select **Day** for the Date Unit. Type **7** as the Step Value. Type **12/31** as the Stop Value. Click **OK**.



	A	B	C	D	E	F	G	H	I	
1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
2										
3	2	4	6	8	10	12	14	16	18	
4										
5	1/1/96	1/2/96	1/3/96	1/4/96	1/5/96	1/8/96	1/9/96	1/10/96	1/11/96	1
6										
7	1/2/96	1/9/96	1/16/96	1/23/96	1/30/96	2/6/96	2/13/96	2/20/96	2/27/96	
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										

Page Previewing and Printing

- Specify how a worksheet will look when printed using the **Page Setup** command on the **File** menu. This command is divided into four different Tab categories which are defined below.

  Page Tab: controls the orientation, scaling, Paper Size, Print Quality, and starting page number for the selected sheet or sheets.

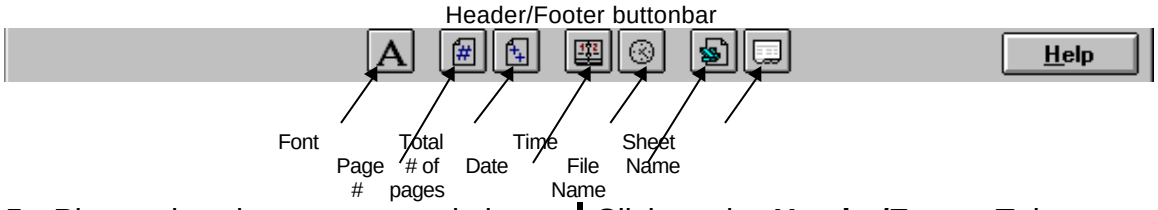
  Margins Tab: controls the page margins, header and footer margins, centers the sheet on the page horizontally or vertically or both.

  Header and Footer Tab: controls the headers and footers for the selected sheet.

  Sheet Tab: Specifies Print Area and controls the Print Titles, Page Order and Draft Quality. Also controls whether gridlines, cell notes, and row and column headings print.
- The **Print Preview** option lets you see how your printed worksheet pages will look before you print them. That way you can make adjustments before printing.
- When you install Microsoft Excel, you specify what type of printer or printers you will be using. A list of installed printers appears in the **Printer Setup** command dialog box. If you have more than one printer installed, you can choose the one you want to use in the Printer Setup dialog box.
- Once you have set up your worksheet page and your printer, you can print worksheets in Print Preview or with the **File Print** command. Page Setup may also be accomplished from the File Print dialog box. It is recommended to use the Print Preview option to preview worksheets before printing. This is particularly true when using a transparency or color printer.

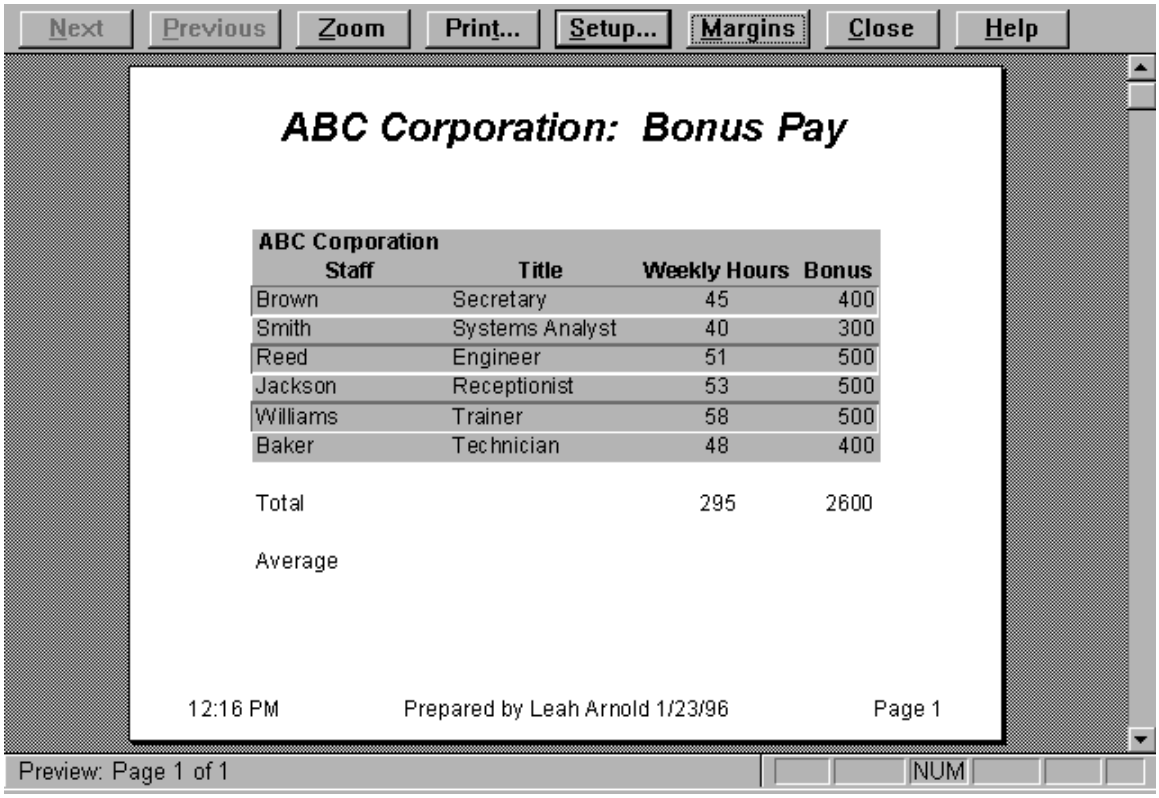
EXERCISE

Task	Comments
1. Open **Sheet1**.	Click on the Sheet1 tab.
2. View a preview of the document.	Select **File** on the menu bar. Select **Print Preview**.
3. Zoom into the worksheet.	Place the mouse pointer inside of the worksheet. Click once to zoom in and then once again to zoom out.
4. Display the Setup dialog box.	Click the **Setup** button.



5. Place a header on your worksheet.	Click on the **Header/Footer** Tab. Choose the **Custom Header** button. Double-click in the **Center** section. Type **ABC Corporation: Bonus Pay**. Highlight the title. Click the **Font** button. Select **18** for the Size. Select **Bold Italic** for the Font Style. Click **OK** to return to the Header box. Click **OK** again to return to the Page Setup box.
6. Place a footer on your worksheet.	Click the down arrow on the Footer box, and select **Prepared by name date, Page 1**. Click the **Customer Footer** button. Click in the left section, and click the **Time** button. Click **OK**.
7. Remove the gridlines from the worksheet.	Click the **Sheet** tab. Click the box next to Gridlines in order to remove them.
8. Remove the Row & Column headings from the worksheet.	Remove the **X** from the Row & Column Headings box.
9. View your worksheet.	Click **OK**.
10. Display the worksheet in	Click the **Setup** button.

Task	Comments
landscape mode.	Click the **Page** tab. Click **Landscape**.
11. Make the worksheet data larger.	Type **200%** in the scaling box. Click **OK**.
12. Center the worksheet on the page.	Click the **Setup** button. Click the **Margins** tab. Place an **X** in the Horizontally and Vertically boxes. Click **OK**.
13. Change the Footer margin to 21 while in the Print view display.	Click the **margins** button to display the handles. Drag the footer handle down to **0.21**. Click the **margins** button again to remove the handles.
14. Go back to your document.	Click the **Close** button.



LESSON 5 CHARTS

LESSON 5: CHARTS

A chart is a graphical representation of values on a worksheet. Worksheet values are selected and then put into chart format. The graphical representation can be a powerful way to display data and interpret text information. Microsoft Excel 5.0 can create several types of charts, these include: area charts, bar charts, column charts, line charts, scatter charts, pie charts and combination charts. Many of these charts can also be created in a three dimensional mode. (The default chart type is a column chart.) Charts may have their own file name (Stand-alone charts) or they may be inserted into a worksheet as part of a file (embedded charts).

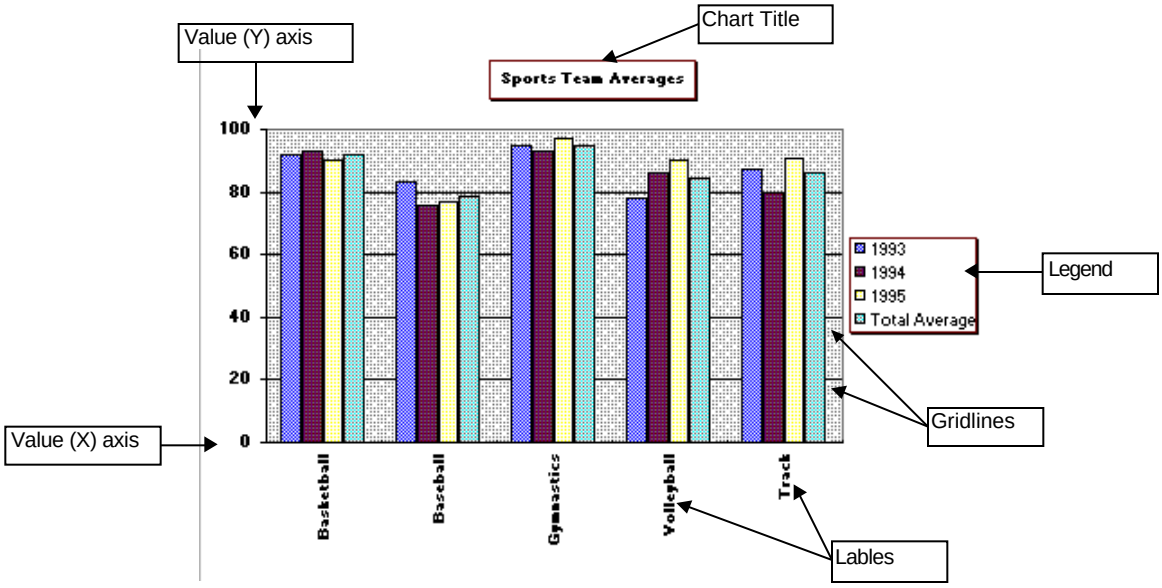
Excel 5.0 enables you to create charts on ***chart sheets***, which are separate sheets of the workbook file that contain only charts, and ***embedded charts,*** which are displayed on the same sheet as the worksheet. When a chart sheet is active in Excel, the menu bar selections change and the charting toolbar automatically is displayed.

LESSON 5: OBJECTIVES

After completing this course, you should be able to:

- Understand the components of a chart
- Create both chart sheets and embedded charts that represent your spreadsheet data
- Modify both chart sheets and embedded charts
- Customize charts by applying formatting
- Use the drawing tools on your charts to add graphic objects
- Understand some of the more advanced charting features

Parts of an Excel Chart



- Excel generates a chart based on the shape of the range selected on your worksheet. Each row or column of data makes up the ***data series***. Each individual value plotted is called a ***data point.*** Data points create data markers that can be displayed as columns, bars, lines, pie slices, etc.
- Excel uses the worksheet row and column text headings as ***labels*** on the chart ***category axis*** (also known as the horizontal or x-axis). If no row or column headings exist, Excel numbers them consecutively beginning with one.
- Excel looks at the range of values in the data and calculates the labels used on the ***value axis*** (also known as the vertical axis or y-axis). These labels are divided evenly and are easily identified.
- ***Gridlines*** are lines that can be drawn in the plot area, usually for the value axis, so that data markers can be easily compared with an axis value.
- A ***legend*** can be added to the chart to identify the different series.

Creating a Stand-Alone Chart

You can create two types of charts in Excel - charts that appear in a chart sheet and embedded charts. When you wish to create a chart independent from the associated worksheet data, **Stand-Alone** chart, you would create a chart sheet. Chart sheets enable you to print a chart separate from data, and you can use page setup formatting to control how the chart will print. When a stand-alone chart is created Excel inserts a new chart sheet named Chart1 and places it in front of the sheet that contains the charted data. The menu bar changes and the chart toolbar is automatically displayed. Separate chart sheets are good to use for overheads or in a slide presentation.

Using the **Insert Chart As New Sheet** command guides you through a step-by-step process to create a chart with the ChartWizard. It displays sample views of the chart as you build it, so that you can see the effect of your choices before the chart is complete. When you have completed all the steps, the chart is complete and will appear on a separate chart sheet within your workbook.

EXERCISE

Task	Comments
Create a stand-alone chart using all of the data	
1. Highlight the part of the data that will be included in your chart.	Highlight cells **A1:D8**.
2. Make it a chart.	Press the <**F11**> key.

EXERCISE

Task	Comments
Create a stand-alone chart using selected data.	
1. Open the Sheet1 worksheet. 2. Create a chart showing staff names and bonuses only.	Click on the **sheet1** tab. Highlight cells **B3:F3**. Select **A2:A8**. Hold down your <**Ctrl**> key and highlight cells **D2:D8**. Press <**F11**>.

Creating an Embedded Chart

Embedded charts are convenient to use when you wish to print your worksheet and chart on the same piece of paper. This type of presentation makes it easier to compare the actual worksheet information to the graphical representation of that data. This is very useful when performing what-if analysis. As soon as you make a change in the worksheet, you can see how it automatically affects the picture. Like any other object, the embedded chart can be sized and moved inside your worksheet.

Embedded charts can be created by using the **Insert Chart On This Sheet** command or by using the **Chart Wizard** button  on the toolbar.

EXERCISE

Task	Comments
1. Activate Sheet 1.	Click on the **Sheet1** tab.
2. Highlight the data to be used in the chart.	Highlight cells **A2:A8** and **C2:C8**.
3. Display the Chart Wizard dialog box.	Click the Chart Wizard button  . (You can also choose the **Insert Chart On this Sheet** command.) Point to cell **B11** and drag to cell **H23** to define the area in which the chart will be placed.
4. Make any necessary changes to the range.	No changes need to be made. Click the **Next** button.
5. Select the 3-D Pie chart.	Click on the 4th box in the 3rd row. Click **Next**.
6. Select a format for the pie chart.	Click on the number **5** chart. Click **Next**.
7. View the percentage of bonuses verses weekly hours.	Click on **Rows**.
8. View the weekly hours for each employee.	Click on **Columns**. Click **Next**.
9. Add a legend.	Click **Yes**. Click **Finish**.
10. Explode the williams slice of the	Double-click on the **Williams** slice of

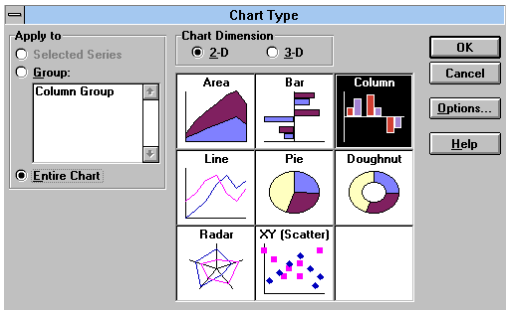
pie.

the pie and drag outward.

Changing the Chart Type

Excel offers eight different 2-D chart types and six different 3-D chart types. The type of chart that you create depends on the data that you are charting. For each type of chart, you have several different formats or subtypes to choose from.You can apply a chart type to the entire chart, a single data series in the chart, or a group of data series. Combination charts can be created by applying different chart types to various data series in a chart.

To change the chart type, you can select **Format, Chart Type** from the menu bar. This will give you the Chart Type dialog box. You must click on 3D or 2D under Chart Dimension to view all 14 different available chart types.



You can also use the **Chart Type** button on the Charting toolbar. Clicking on the list box will give you a dropdown menu of the 14 different chart types.

On the following page is a list of the different chart types and a brief description of each one.

CHART TYPE	USE
Area	To show how subjects such as sales and production figures change over time.
Bar	To display individual values for comparison. Categories are shown on the vertical axis and values are shown on the horizontal axis.
Column	To display individual values for comparison. Categories are shown on the horizontal axis and values are shown on the vertical axis.
Line	To show trends over even time intervals plotted on the category axis.
Pie	To display one data series as a whole, with each slice of the pie representing a percentage of the whole.
Doughnut	To compare the sizes of pieces in a whole unit. Similar to a pie chart except that it allows you to display more than one data series.
Radar	To show the relationships between individual data series and also between a specific data series and the whole. This chart type could be use to show each individual's distance from a central location. Each individual datapoint would be a spoke on the chart. Lines that connect the datapoints to the central location, define the area covered by each individual.
XY (Scattergram)	To compare trends over uneven intervals. Both the category axis and the value axis consist of numeric values.
3-D Area	To show a three-dimensional view of an area chart.
3-D Bar	To show a three-dimensional view of a bar chart.

CHART TYPE	USE
3-D Column	To show a three-dimensional view of a column chart.
3-D Line	To show a three-dimensional view of a line chart. Lines are displayed as ribbons or bands.
3-D Pie	To show a three-dimensional view of a pie chart.
3-D Surface	To show high and low points along a surface resulting from two sets of data..

EXERCISE

Task	Comments
Changing a chart type using the toolbar	
1. Activate the Chart1 sheet. 2. View the different types of charts.	Click the **Chart1** tab. Click the **Chart Type** button  . Click on each type of chart, one at a time.
Changing a chart type using the menu	
1. Activate the Sheet1 worksheet. 2. Activate the embedded chart. 3. Change the chart type.	Click the **Sheet1** tab. Double-click on the chart. Select **Format** on the menu bar. Select **Chart Type**. Select **2-D** under Chart Dimension. Select **Doughnut**, then click **OK**.

Make a Stand-Alone chart embedded

Stand-alone charts can be used independent of other documents. From time to time, a stand-alone chart may be needed to enhance the look of a worksheet. When this time arises, that stand-alone chart may be copied onto any worksheet. Once the chart is embedded on a worksheet, you must double-click the border in order to edit it.

EXERCISE

Task	Comments
1. Activate Chart1.	Click on the Chart1 tab.
2. Copy the chart to Sheet1.	Click on the border of the chart until it is selected. Select **Edit** on the menu bar. Click **Copy**. Activate the Sheet1 worksheet. Click on cell **B10**. Select **Edit**, then **Paste**.
3. Make the chart smaller.	Hold down the left mouse button on one of the corner handles and drag inward.
4. Preview the worksheet.	Select the **File** menu. Click **Print Preview**.

Make an Embedded chart stand alone

Just like stand-alone charts may be embedded, so may embedded charts be made to stand-alone.

EXERCISE

Task	Comments
1. Activate Sheet2.	Click on the Sheet2 tab.
2. Select the chart.	Double-click on the embedded chart border to activate it.
3. Make it stand alone.	Press <**F11**> on your keyboard. (This chart is now called Chart3.)
4. Preview this sheet.	Select the **File** menu. Click **Print Preview**.

Inserting Text

There are two types of text that you can add to a chart file. The first type of text is associated with specific objects in a chart such as titles and axes. You can select this type of text and change it or reposition it. The second type of text is free-floating text. It is not associated with any particular object in the chart. Unattached text appears in a box that can be resized and moved. The text wraps inside of the box. Unattached text is used frequently to place comments on a chart. Both types of text can be formatted.

You can insert titles by choosing the **Insert Titles** command and labels by using the **Insert Data Labels** command. The data values can be values or labels with the exception of the pie or doughnut chart , where they can also be percents. If you do not choose a specific series, data labels are entered on the chart for all data series. To insert unattached text, you simply select any nontext object in the chart, and type the desired text. If you are creating an embedded chart using the ChartWizard, you can add titles and labels for the legend as you create the chart.

EXERCISE

Task	Comments
1. Activate Chart3.	Click on the **Chart3** tab.
2. Add a chart title.	Select **Insert** on the menu bar. Select **Titles**. Choose **Chart Title**, then **OK**. Type **Bonuses for the Month fo March**, then press <**Enter**>.
3. Deselect the chart title.	Press <**ESC**>.
4. Add a category axis title.	Select **Insert Titles**. Choose **Category (X) Axis**, then **OK**. Type **Employees**, then press <**Enter**>.
5. Add a value axis title.	Select **Insert Titles**. Choose **Value (Y) Axis**, then **OK**. Type **Bonuses**.
6. Show all of the data labels.	Select **Insert Data Labels**. Choose **Show Value**, then **OK**.
7. Delete the legend.	Select the legend. Press the <**delete**> key.

Formatting Text & Numbers

You can change the default font for all of the text in a chart or you can change the font for a specific chart area. If you wish to change the default font for all your chart text, double-click in your chart area (any empty space on the chart that is outside of the plotting area) to display the **Format Chart Area** dialog box. You can also click once in the chart area, and choose the menu command **Format Selected Chart Area**. To change the font for a specific chart item, double-click on the chart item or click once on the item and choose the menu command **Format Selected (chart item)**. You can easily change the alignment of the text in your charts. For some text objects, such as titles, you can change the horizontal and vertical position as well as the orientation of the text. For other objects, such as the labels on axes, you can just change the orientation.

Borders may be added to any individual chart item. The entire chart can also be enclosed inside of a border. When you create a custom border, you have the ability to choose the line type, line weight, and color of the border.

Using the Number tab in the Format (chart item) dialog box, you can apply different number formats, such as percents, currency, or decimal, to the numbers on your chart.

EXERCISE

Task	Comments
1. Make the chart title larger.	Click on the chart title. Click the **Font Size** button and change to **18**.
2. Give the chart title a border.	Select **Format**. Click **Selected Chart Title**. Click the **Patterns** tab. Select **Custom**. Choose another color. Select the bottom weight option, then click **OK**.
3. Make the category axis title larger.	Click on the category axis title. Select **12** on the **Font Size** button.
4. Make the value axis title larger.	Click on the value axis title. Select **12** on the **Font Size** button.
5. Format all of the text in the chart at once.	Double-click anywhere on the chart's white background. (The Format Area dialog box is displayed). Click the **Font** tab.

Task	Comments
6. Change the alignment of the category axis labels.	Select **Arial**, **Bold**, **12**, then click **OK**. Double-click on any category axis label. (The Format Axis dialog box appears.) Select the **Alignment** tab. Choose the top box, then click **OK**.
7. Change the format of the value axis to show currency.	Double-click on any value axis label. Select the **Number** tab. Choose **Currency** in the category box. Choose the first option, then click **OK**.
8. Change the number format of the data labels to currency.	Double-click on any series of data labels. Select the **Number** tab. Choose **Currency** in the category box. Choose the first option, then click **OK**. Double-click on another series of data labels and do the same until all of the labels are changed.

Formatting the Chart

With Excel 5.0, some of the objects in a chart may be moved or resized. You can move all titles, the legend, data labels, individual slices in both pie and doughnut charts, and graphic objects that you may have added to your chart such as text boxes and arrows. An entire embedded chart can also be sized or moved to any location on your worksheet. Since the embedded chart is an object on your worksheet, you can move it around your worksheet by dragging. You can also size an embedded chart by using the selection handles that surround the chart when it is selected. When you size an embedded chart, it keeps its dimensions proportional. When a chart item is dragged to an area of the chart that already contains information, the chart does not resize to make room for the item, the data underneath the chart item gets covered. The chart will adjust to make room for a chart item if you move it by using the Placement tab in the Chart items Format dialog box. To display the chart item's format dialog box, you can either double-click on the chart item or select the item and choose the command **Format Selected (name of the object)**.

Gridlines make it easier to compare data points on the chart with the axis values. Gridlines extend from the tick marks for an axis across the plot area. You can add gridlines that originate from either the category or value axis, or both. You can also choose whether gridlines originate from only major divisions on an axis or from points between major divisions.

Scaling may be changed for both the value and category axes. Intervals and starting numbers can be changed on the value axis. For the category axis, you can change how the category labels are displayed and also reverse the order in which the data series are plotted along an axis.

Using the Drawing toolbar, you can add all sorts of graphic objects such as lines, arrows, rectangles, ellipses, and text boxes to your chart.

EXERCISE

Task	Comments
1. Change the Y axis scale to increments of $100.	Double-click on the Y axis. Select the **Scale** tab. Type **100** in the Major Unit box, then click **OK**.
2. Remove the horizontal gridlines.	Click the **Horizontal Gridlines** button on the Chart toolbar. 

Task	Comments
3. Insert Minor gridlines.	Select **Insert**, then **Gridlines**. Select **Minor Gridlines** for the Value (Y) axis. Click **OK**.
4. Choose the major gridlines instead.	Select **Insert Gridlines**. Select **Major Gridlines** for the Y axis and deselect Minor gridlines, then **OK**.
5. Change the bars to their corresponding colors.	Double-click on the 1st bar for **Brown**. Select the color **green**, then **OK**. Double-click on the 2nd bar for **Smith** and select **blue**, then **OK**. Double-click on the 3rd bar and select **white**, then **OK**.
6. Change the color and pattern for the plot area.	Double-click on the plot area. In the Area box, select a color and pattern. (Gray usually works best.)
7. Open the Drawing toolbar.	Select the **View** menu, then **Toolbars**, then **Drawing**, then **OK**.
8. Add a arrow to your chart	Click the **Arrow** button.  Draw an arrow to the $300 bar.
9. Format the arrow.	Double-click the arrow. Select the last line in the weight box. Change the style of the arrow if necessary.
10. Add a text box.	Click the text box button.  Type **Lowest Bonus**.
11. Close the Drawing toolbar.	Click the **Control** button. 
12. Make the text box font larger.	Click once on the text bar. Change the font to **12** and make it bold.

Chart Protection

Chart protection allows you to protect the contents and objects of the chart sheet from your own accidental changes or from any unauthorized use. The chart sheet itself or the entire workbook can be protected.

A password is optional when protecting your data. This adds security to your file so that an unauthorized person will need to have access to your password in order to use it.

EXERCISE

Task	Comments
Protecting a Chart	
1. Display the Protect Sheet dialog box.	Select **Tools** on the menu bar. Select **Protection Protect Sheet**.
2. Protect the contents and the objects.	Verify that contents and objects is selected, then click **OK**.
3. Try to modify your chart.	Double-click on a bar. A message appears, ***"Cannot use that command on a protected sheet."*** Click **OK**.
Unprotect a Chart	
1. Display the Protect Sheet dialog box.	Select **Tools Protection Unprotect Sheet**.
2. Try to modify your chart.	Double-click on a bar. The Format Data Series dialog box appears. Click **Cancel**.